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January 15, 1952 Progress Report

Contract NObsr-42080

Status of Work January 1, 1952

Summary:

(A) The low temperature infrared optical system outlined in the September report is very nearly completed and should be in operation within several weeks.

(B) The design of a proposed FIR pickup tube utilizing the glass film target is outlined.

(A) Infrared Optical System

The September, 1951 progress report describes and includes a drawing of a vacuum optical system which will provide an absolute calibration of the glass target film sensitivity to low temperature radiation. The mechanical work on this system is now entirely completed and the unit is in the process of assembly. The envelope has been leak checked and found to be entirely vacuum tight. If no serious difficulties arise the unit should be entirely completed and in operation within the next few weeks.

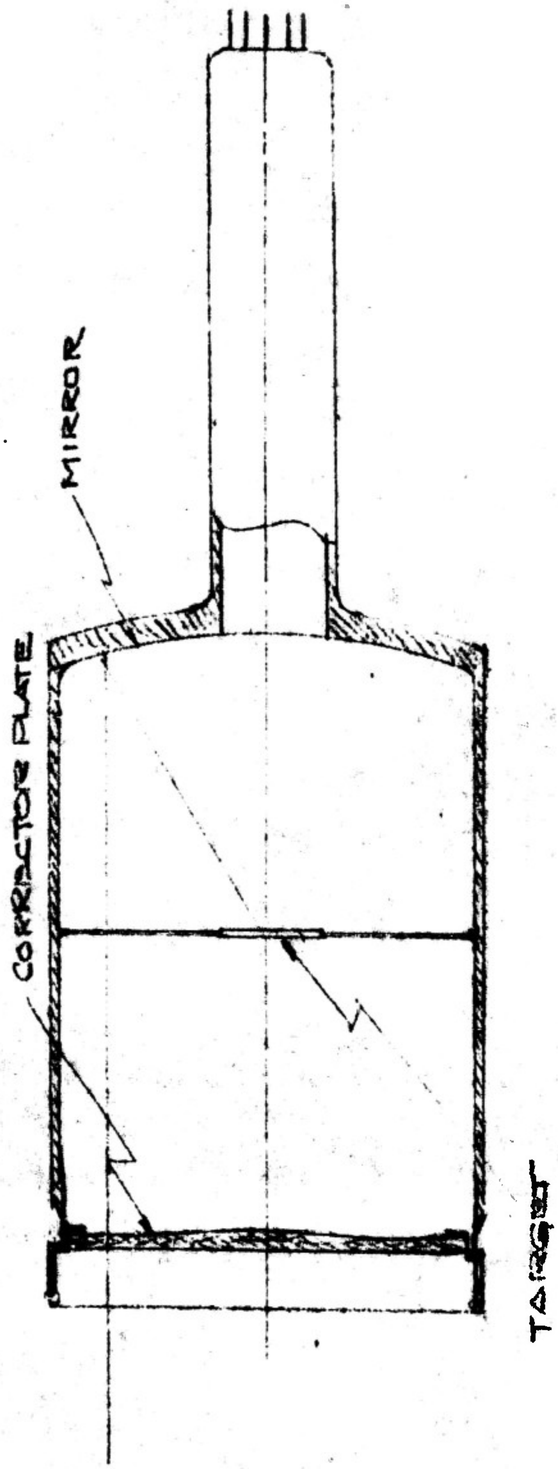
(B) FIR Orthicon with Reflective Optics

A design of an orthicon for direct pickup of low temperature heat sources utilizing the glass films as the detector element is outlined in Figure 1. It has been designed around suitable reflective optics available at the present time. Use is being made of a 100 mm Schmidt system with silver chloride corrector plate. The system was designed by Baird Associates under Contract NObsr-39180 and furnished by the Bureau of Ships. The system has been designed for infinite throw which will probably mean that the results will not be too satisfactory for distances available in the present laboratory. Figure 1 shows the tube in the final form as it is visualized, the silver chloride corrector plate being sealed to a silver ring or cup and this in turn sealed to a metal ring previously sealed in the glass envelope of the tube proper. A similar tube incorporating the sealed-in mirror has been built in this laboratory with very satisfactory results, so that no major difficulties are expected in following this design. Because of the high cost of producing the final design, it is believed wise at this time to design a demountable tube which permits rapid change and adjustments of the targets before going to the final design. This will permit proving in the whole system before the final tubes are built. This demountable tube is shown in Figure 2. Some expression is desired from the Bureau on this next phase of the work before proceeding with same.

Approved:

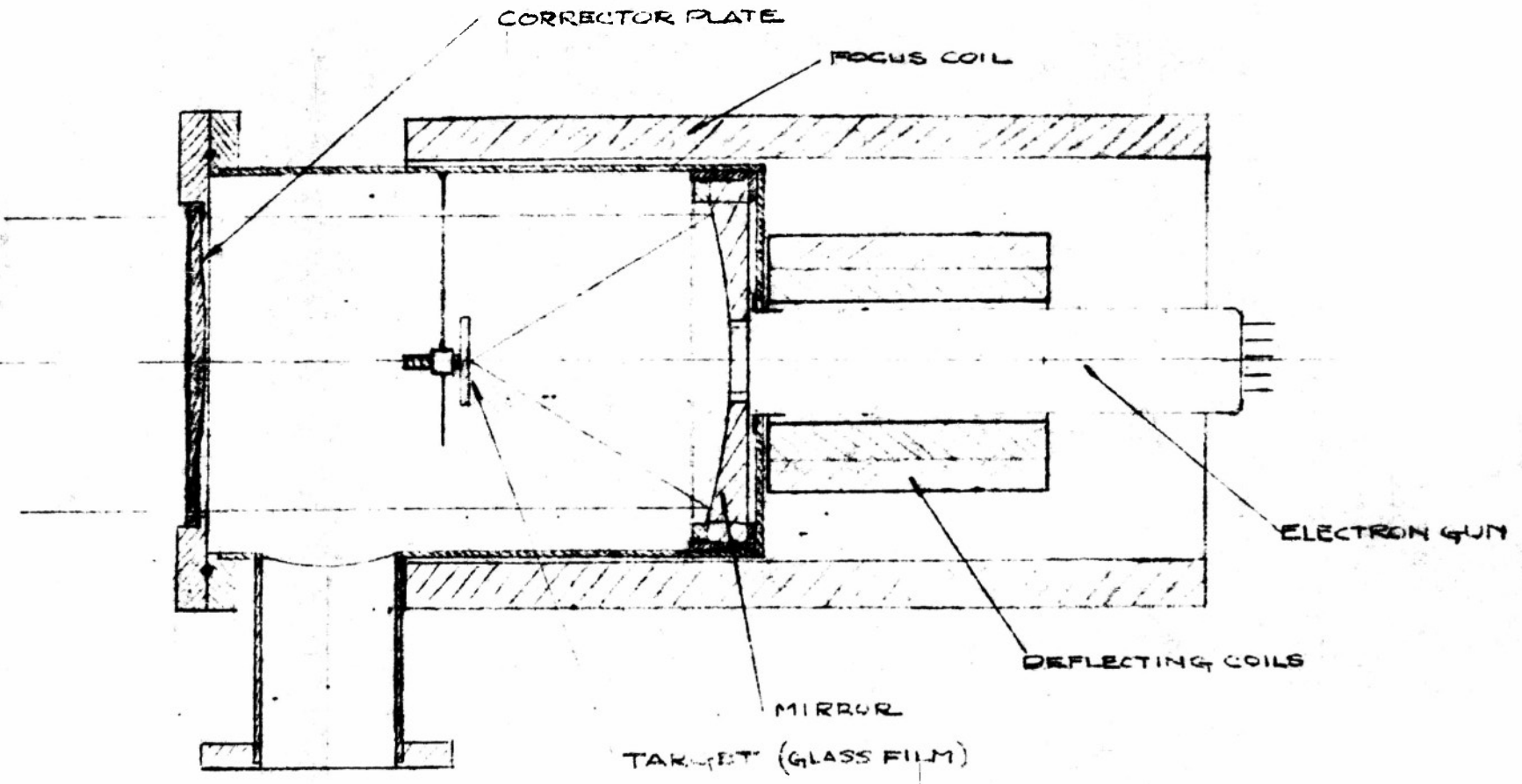
George R. Mitchell

G. Mitchell, Project Engineer



PROPOSED SEALED OFF FIR PICKUP TUBE
(GLASS FILM TARGET)

Fig 1



PROPOSED FIR PICKUP TUBE
(DEMOUNTABLE MODEL)

FIG 2